Slowing the Aging Clock

Presenter: Michael Ochranek

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About the Presenter

- Michael Ochranek
- Certified Personal Fitness Trainer
- Certified Group Exercise Instructor
- 19 years of experience training the geriatric population
- Coordinator at the NASA Goddard Fitness Center

Slowing the Aging Clock:
Presentation Outline

- Brief review of human development
- Benefits of exercise
- Types of exercise
- Starting a program
- Specific examples
- Inspiration
- Questions

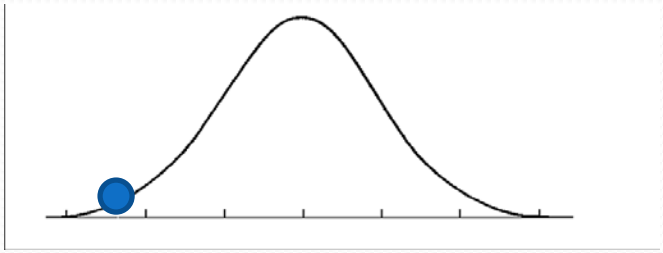
Human Development

Age

- 2-6 years
- 7-12 years
- 13-17 years
- 18 years
- 19-40 years
- 41-59 years
- 60+ years

Physiological and Neurological Responses to Aging

- Depth perception not mature
- Selective attention poor



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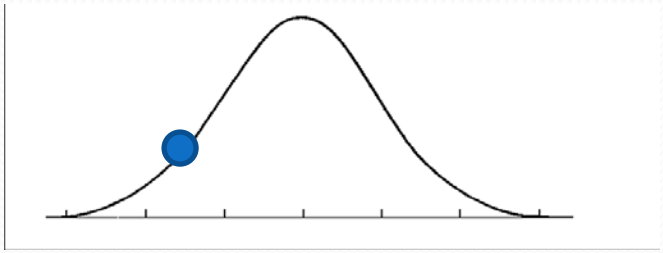
Physiological and Neurological Responses to Aging

- Growth plates are a concern
- Lower stroke volume, cardiac output, and VO_2 max (immature cardiovascular system)
- Divided attention poor
- Short term memory limited



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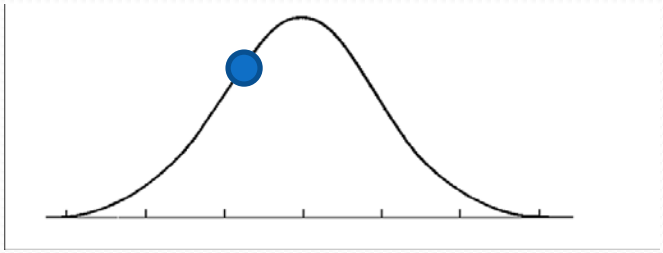
Physiological and Neurological Responses to Aging

- Strength and growth spurts
- Growth plates seal
- Greatest increase in flexibility



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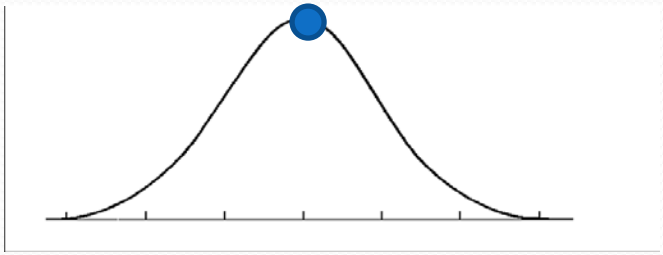
Physiological and Neurological Responses to Aging

- PEAK



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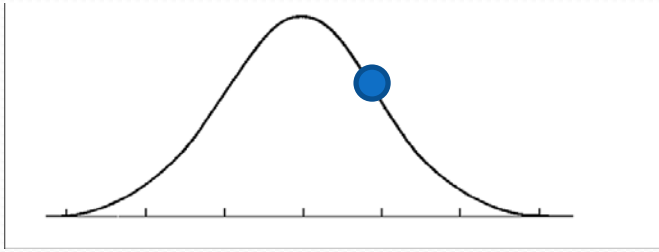
Physiological and Neurological Responses to Aging

- ½ pound muscle loss per year
- 0.5% reduction of metabolic rate per year
- Tendons and ligaments become less resilient and flexible
- Increase of ½ pound body fat/year
- Cardiac output reduces VO_2 max by 9% per decade (worsening of cardiovascular function)



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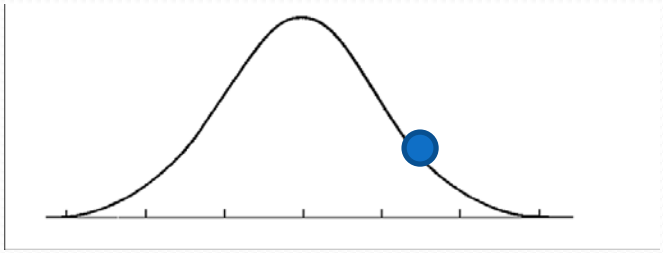
Physiological and Neurological Responses to Aging

- Blood pressure rises due to decreased diameter of blood vessels
- Bones begin to lose density



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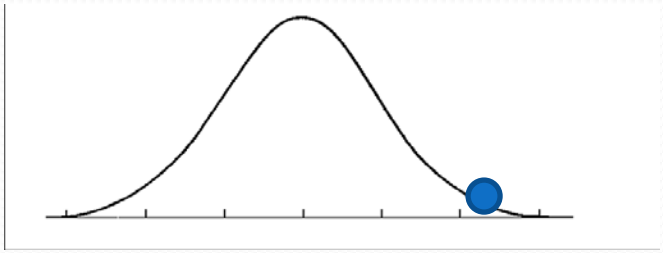
Physiological and Neurological Responses to Aging

- Nervous system slows (reaction time)
- Balance is less controllable



Benefits of Exercise: Cardiorespiratory

- Improves cardiovascular function
  - Decreased resting and exercise heart rates
  - Increased aerobic work capacity
  - Increase in resting and maximum stroke volume
  - Increase in maximum cardiac output
- Reduction of blood pressure
- Increased HDL cholesterol
- Decreased total cholesterol

Benefits of Exercise: Body Composition

- Increase utilization of fat for energy
- Decreased body fat
- Increased metabolism
- Improvement in muscle tone and skin elasticity

Benefits of Exercise: Quality of Life

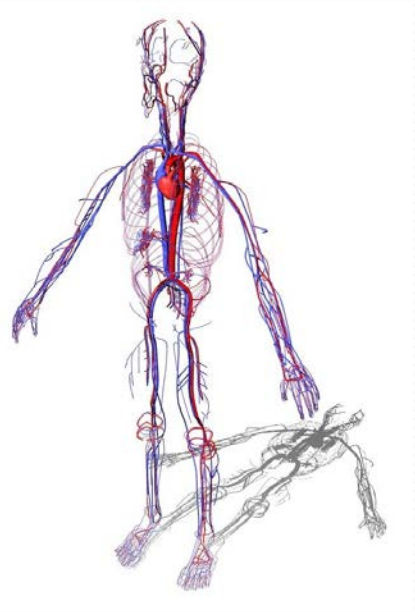
- Decreased anxiety, tension/stress and depression
- Improved self-esteem
- Increased self confidence
- Approval of looks of one's own bodv
- More sex appeal

Benefits of Exercise: Hormonal

- Reduction in glucose-stimulation insulin secretion
- Reduction in cortisol-release (strengthens immunity, improves bone density, increased libido)

Benefits of Exercise: Circulatory

- Increase in capillary density
- Increased blood flow to active muscles
- Decreased risk of developing varicose veins



Benefits of Exercise: Muscular

- Increased muscle fiber size
- Increase muscle contraction strength
- Increased tendon tensile strength (decreased risk of muscle strains/injury)
- Flexibility training reduces muscle soreness
- Flexibility training decreases risk of low back pain
- Decreases healing time after injury

Benefits of Exercise: Skeletal

- Increase ligament tensile strength (decreased risk of sprains/injuries)
- Flexibility training provides increased blood supply and nutrients to joint structures
- Increased bone density (decreased risk of osteoporosis)

Benefits of Exercise: Function

- Increased physical efficiency and performance
- Increased neuromuscular speed and coordination
- Improved balance and postural awareness
- Reduced risk of falls

Types of Exercise

- Low Impact Exercise
- High Impact Exercise
- Cardiovascular Training
- Strength Training
- Flexibility Training
- Combination Training

Low Impact v. High Impact

	Low Impact	High Impact
What is it?	At least one foot stays on the ground during the exercise	Both feet are off the ground at the same time
Pros	• Easier on joints • Lower risk of injury	• More energy expended • Improves bone density
Cons	• Difficult to burn more calories • Less effective in strengthening bones	• Increased risk of injury • Difficult for beginners
Candidates	• Lower functioning individuals • Beginners • People with arthritis/osteoporosis	• People who already have a moderate fitness baseline • People who aren't at risk for joint problems
Examples	• Biking • Ellipitical Machine • Step Aerobics • Walking/Hiking • Pilates/Yoga • Most Weight Training	• Running • Jumping Rope • Jumping Jacks • Many Recreational Sports

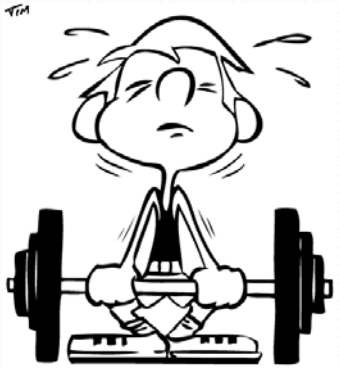
*Also consider Non-Impact Exercise (water aerobics, seated exercises)

Cardiovascular Training

- AKA Aerobic exercise
- Most effective at improving heart function
- Requires an increase in heart rate during exercise to challenge the cardiovascular system
- Examples: Running, walking, cycling, most recreational sports

Strength Training

- Most effective at improving strength, muscular endurance and tone.
- Requires manipulating more resistance than is encountered on a daily basis
- Examples: free-weight lifting (dumbells/barbells), machine weight lifting, calisthenics (using your own body weight to challenge your muscles)



Flexibility Training

- Most effective at preventing injury
- Requires stretching the muscles just past their normal length
- Examples: isolated muscle stretching (basic stretching), Tai Chi, Yoga/Pilates

Combination Training

- Circuit Training
  - Involves moving from one type of exercise to the next and spending a short amount of time with each exercise
  - Example: Spend 1 minute performing a strengthening exercise, 1 minute performing a cardiovascular exercise and 1 minute performing a stretch. Cycle through different exercises for 30 minutes.
- Interval Training
  - Involves spending some time performing a high-intensity exercise, followed by some time performing a low-intensity exercise and cycling between the two
  - Can be used with strength training or cardiovascular training
  - Beginners should spend a short amount of time on the high-intensity exercises and a longer amount of time on the lower-intensity exercises
- F.A.B. Workout Program
  - Designed by Michael Ochranek for strength and endurance training
  - Involves performing each exercise using light weight for an increased amount of repetitions
  - Allows strengthening while lowering risk of injury because light weight is used

Starting an Exercise Program

- Check with your doctor
- Know your body and it's limits
- Select appropriate exercise for your fitness level
- Start with simple, low-impact exercises
- Get help – pair up with an experienced friend, take classes or hire a Personal Fitness Trainer to guide you

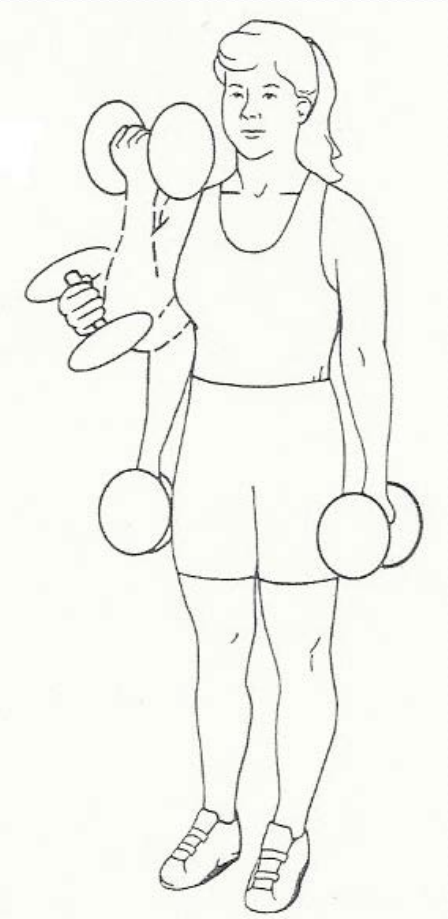
Safety Tips

- Don't hold your breath during exercises (this could effect your blood pressure)
- Use smooth, steady movements. Avoid jerking or thrusting movements
- Avoid locking the joints in your arms and legs
- It is normal to feel sore after exercise for a few days but exhaustion, sore joints and painful muscle pulls are not normal

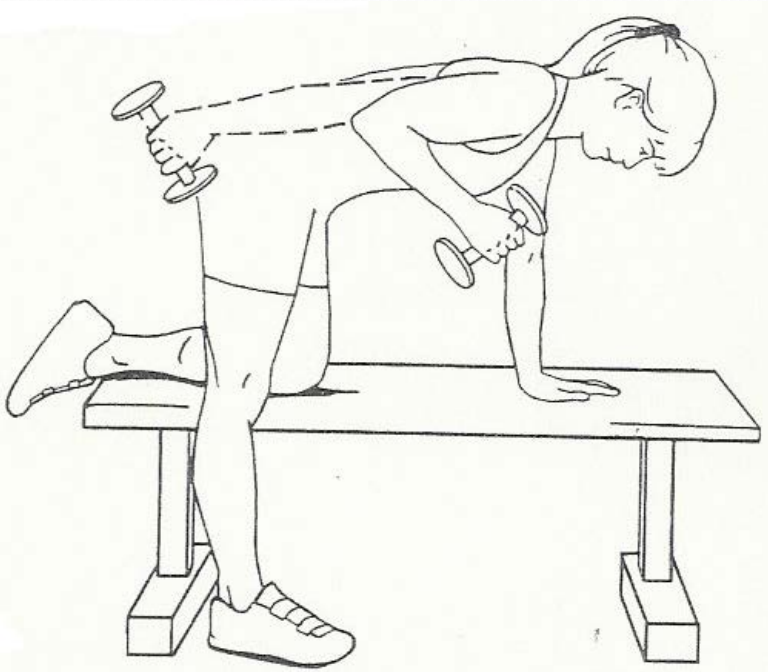
Examples of General Exercises

- Bicep Curls
- Tricep Extensions
- Bent Over Rows
- Lateral Raises
- Partial Sit-ups
- Wall Squats
- Knee Flexion

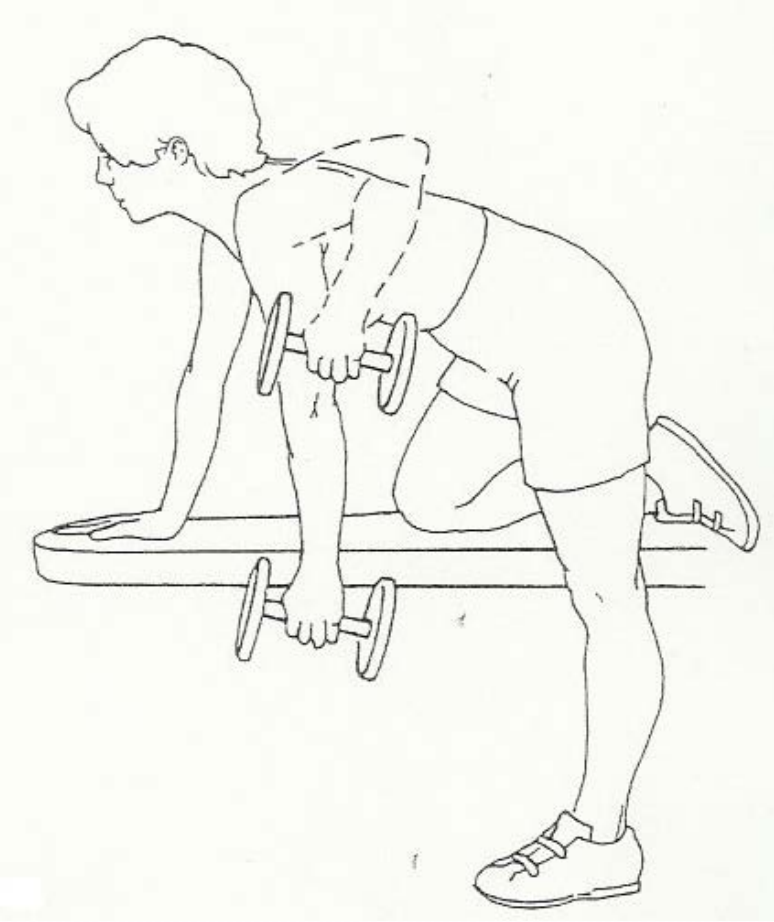
Bicep Curls



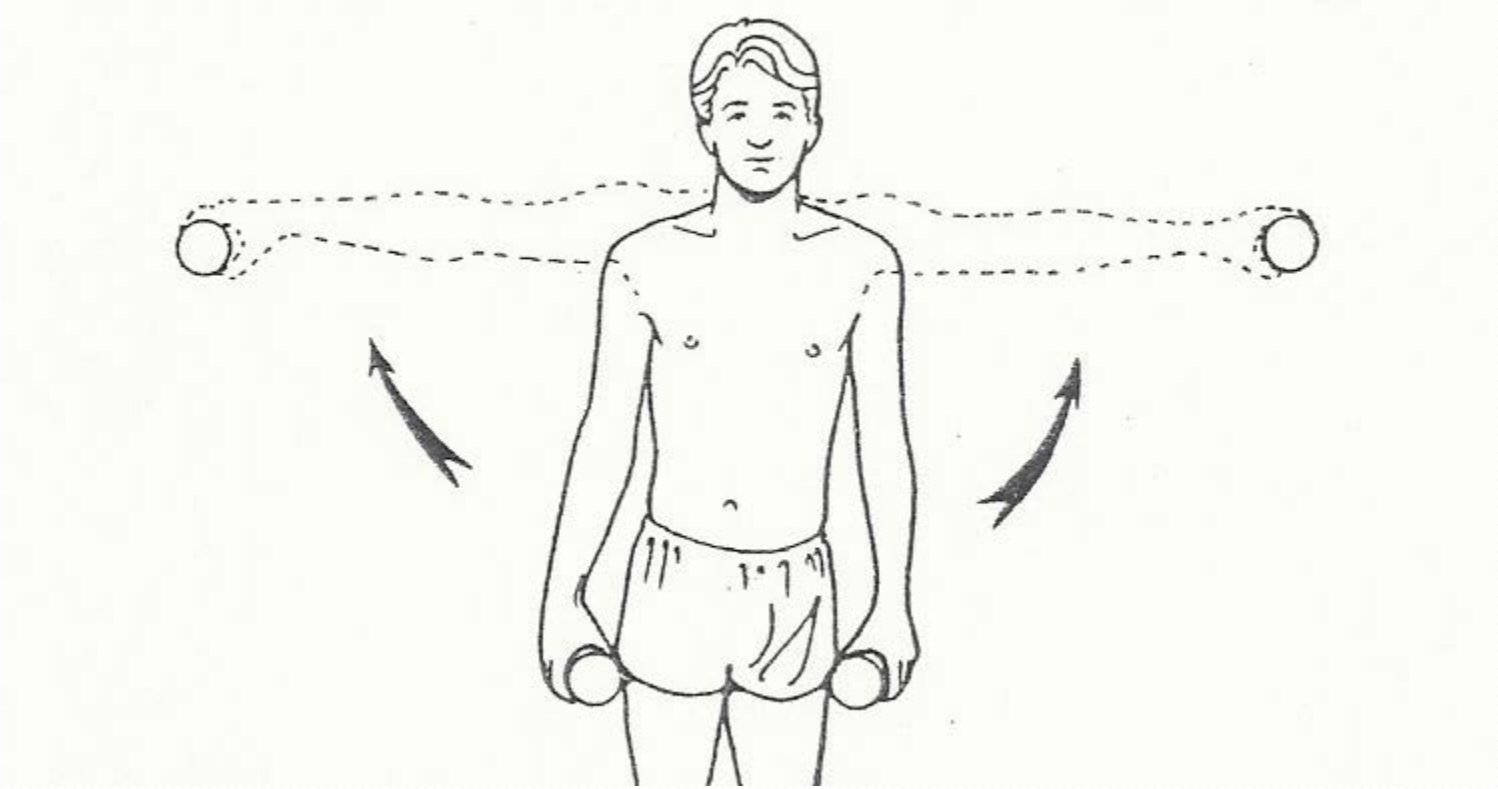
Tricep Extensions



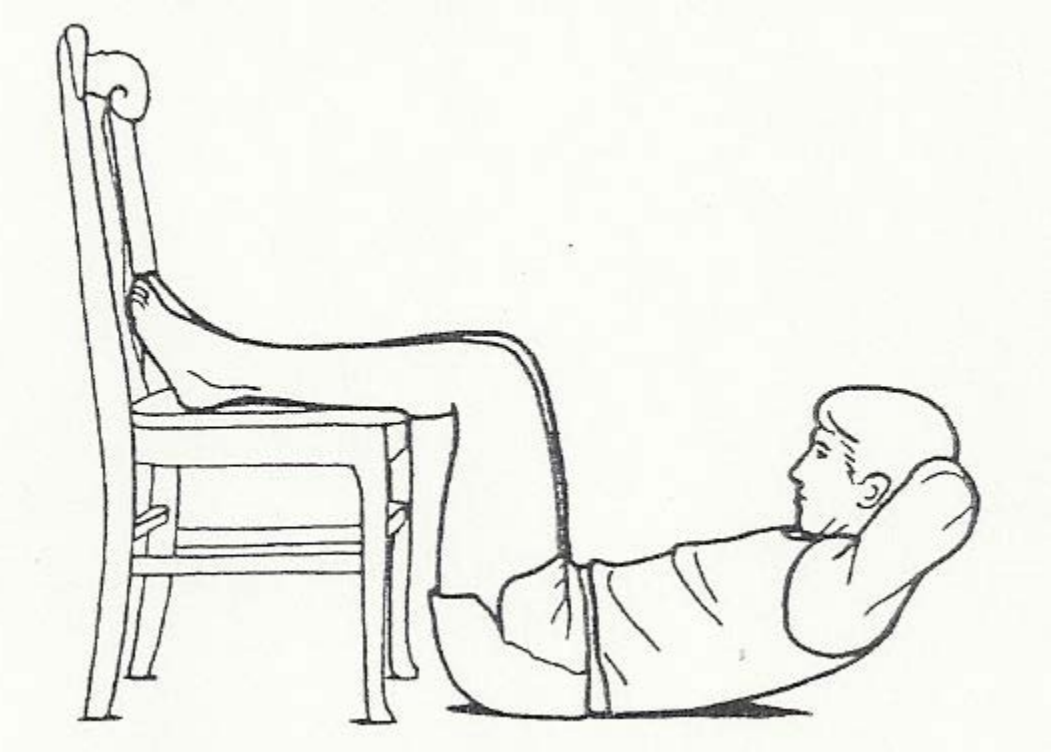
Bent Over Rows



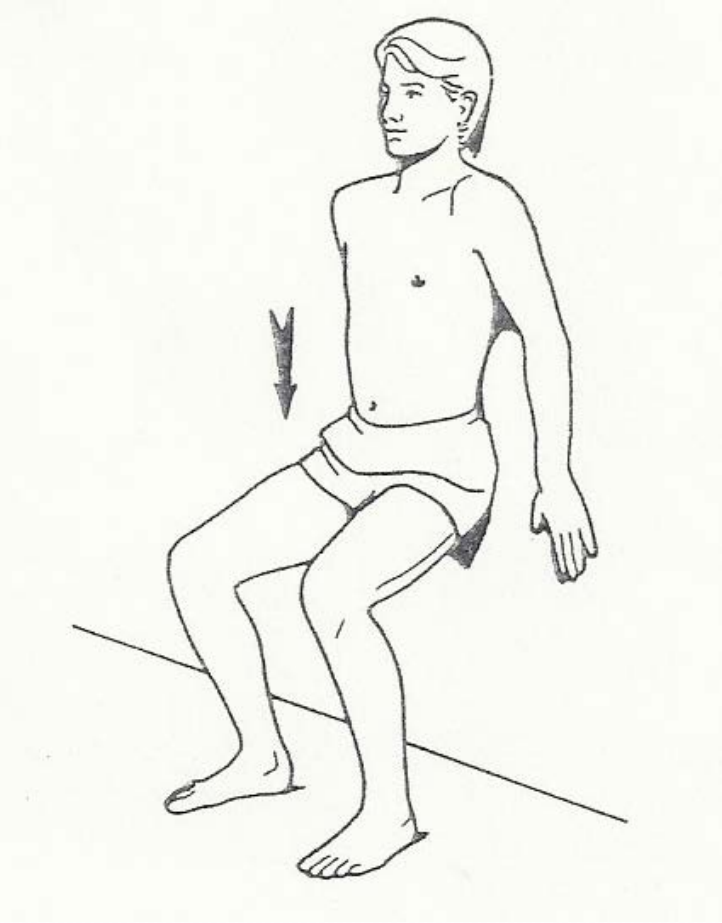
Lateral Raises



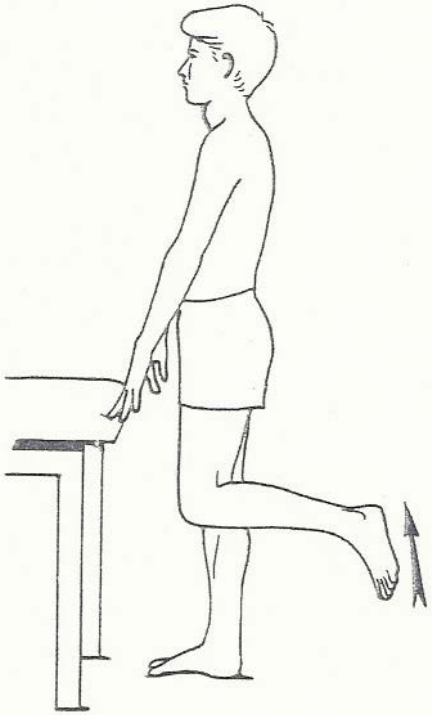
Partial Sit-ups



Wall Squats



Knee Flexion



From Triathlons to Body Building, Seniors Do It All!

From Triathlons to Body Building, Seniors Do It All!

- Tao Porchon-Lynch, 93, wins ballroom dance competitions and teaches at least 12 yoga classes a week.

From Triathlons to Body Building, Seniors Do It All!

- Lew Hollander, 80, became the second 80-year-old to complete the Ford Ironman World Championship (2.4-mile swim, a 112-mile bike ride and a 26.2-mile marathon)

From Triathlons to Body Building, Seniors Do It All!

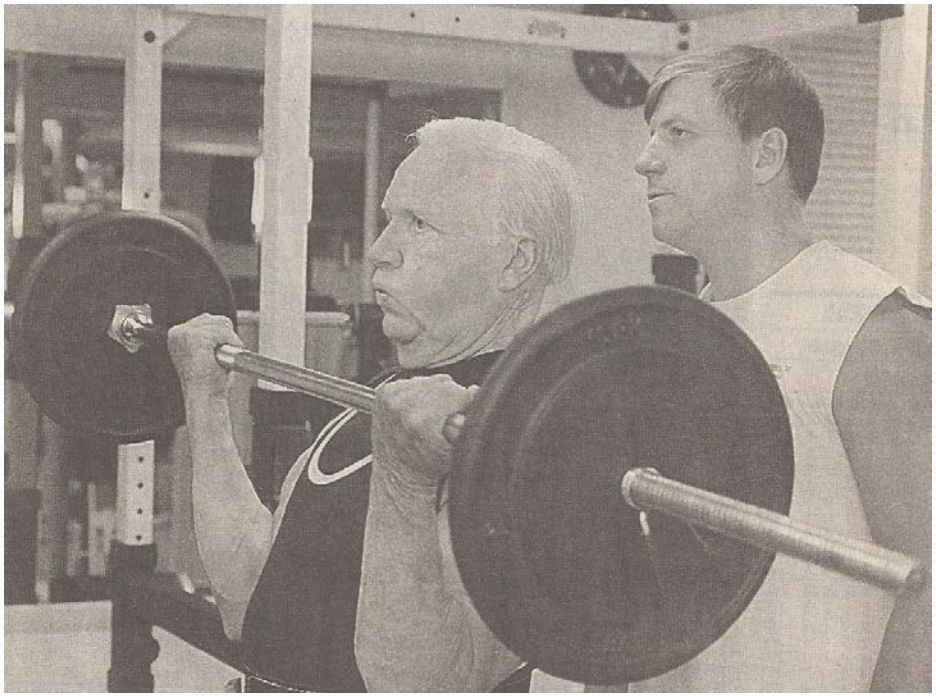
- Allan Johnson, 80, still competes in rodeo competitions

From Triathlons to Body Building, Seniors Do It All!

- Anne Dunivin, 95, competitive swimmer has set national records in her age group

From Triathlons to Body Building, Seniors Do It All!

- Larry Atkinson, 78, won 12 bodybuilding events with the help of his trainer Michael Ochranek



From Triathlons to Body Building, Seniors Do It All!

- What will you accomplish?

Questions?